Homework 1: Preliminary Design Project Proposal Due: Thursday, January 22, at Classtime

Team Code Name:Group 12		Group No12
Team Members (#1 is Team L	Leader):	
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Abstract:

A "digital picture frame with display" will be created using a liquid crystal display, various push buttons, and a power light. The push buttons will be used for navigation between individual pictures, which will be received via an Ethernet connection. The Ethernet connection may eventually be connected to a wireless bridge in order to utilize 802.11b/g.

Design Objectives:

- Interface an LCD display to a microcontroller
- Interface a microcontroller with Ethernet
- Interface microcontroller with IR remote
- Provide on-chip JPEG decoding to reduce bandwidth usage
- Interface microcontroller with on-board memory (~8 MB) for image storage
- Run the entire system using an inexpensive, commercially available power supply
- Design a user-friendly, aesthetically pleasing, thin, light-weight, ergonomic case
- Write a user-friendly program to run on a PC which would take care of transmitting data via Ethernet to the device as well as ensuring proper image size and color depth

Design/Functionality Overview:

The digital picture frame will display digital photographs utilizing the JPEG format. It will use a Rabbit microcontroller with Ethernet accessing capabilities to load images from a PC. The picture will be displayed on a graphic color LCD display and the system will contain a peripheral 8 MB RAM for extra image storage. The display will contain two pushbuttons that enable the user to cycle through images stored on the PC. We will also implement an IR transmit/receive capability that will enable a user to cycle through pictures remotely. The entire system will be powered by a 12 VDC power supply. There will be an onboard JPEG decoder chip if possible to reduce the bandwidth needed to transfer the pictures via TCP/IP. Finally, there will be a small GUI on the PC controller allowing the user to select images as well as ensure that each image is properly scaled with the correct color depth. The Rabbit microcontroller will interface with this "control GUI" via Ethernet.

Project-Specific Success Criteria (list 5):

- 1. Ability to display debugging information on the LCD
- 2. Ability to receive image data via Ethernet
- 3. Ability to receive and interpret IR signals from remote
- 4. Ability to successfully store all image data in on-board memory
- 5. Ability to effectively decode the JPEG format